

IN THE CLAIMS:

Claims 1-19. Canceled.

20 (New). An information searching device comprising:

a buffer for storing data to be searched,

a selector configured and arranged to select at least a portion of the buffer's contents; and

a storage facility coupled to the selector so as to receive the selected portion of the buffer's contents, the storage facility having a plurality of associative memories sequentially configured and arranged such that the output from an upstream associative memory is provided to at least one downstream associative memory, the associative memory being loaded with information against which data in the buffer is to be matched, wherein

the information is translated into a Boolean function prior to being loaded into the associative memories, and

each associative memory stores a segment of the Boolean function.

21. (New) The information searching device of claim 20 further comprising preparser logic configured to extract one or more fields of a network message, and to place the extracted fields into the buffer.

22. (New) The information searching device of claim 21 wherein the preparser logic prepends the extract fields to the network message, and places both the network message and the prepended extracted fields into the buffer.

23. (New) The information searching device of claim 22 wherein the information stored in the associative memories corresponds to one or more Access Control Lists (ACLs) specifying actions to be applied to network messages.

24. (New) The information searching device of claim 23 wherein the network message is an Internet Protocol Version 6 (IPv6) message.

25. (New) The information searching device of claim 20 wherein the information is first translated into a Binary Decision Diagram (BDD), and each segment of the BDD is translated into a Sum of Products (SOP) format prior to being loaded into its respective associative memory.

26. (New) The information searching device of claim 20 further comprising a plurality of secondary memories each having a plurality of storage locations, wherein a selected one of the secondary memories is associated with each associative memory,

each associative memory has a plurality of entries,

each associative memory entry identifies a matching storage location of its associated secondary memory, and

a downstream associative memory receives as an input a selected portion of the buffer and the matching storage location of the secondary memory associated with the upstream secondary memory.

27. (New) The information searching device of claim 26 wherein the matching storage location of the secondary memory associated with the last of the associative memories indicates an action for the data stored in the buffer.

28. (New) The information searching device of claim 20 is formed from:

- (a) one or more Application Specific Integrated Circuits (ASICs);
- (b) one or more Field Programmable Gate Arrays (FPGAs); or
- (c) at least one ASIC and at least one FPGA.

29. (New) An information searching device comprising:

means for selecting a portion of data to be searched; and

means for searching the selected data portion for a predefined value, wherein

the searching means includes a plurality of associative memories organized in a stream such that the output from an upstream associative memory is provided to at least one downstream associative memory, the associative memories being loaded with information against which data in the buffer is to be searched, wherein

the information is translated into a Boolean function prior to being loaded into the associative memories, and

each associative memory stores a segment of the Boolean function.

30. (New) The information searching device of claim 29 wherein the data to be searched is a network message having a plurality of fields that are searched for a predefined value.

31. (New) The information searching device of claim 30 further comprising means for identifying an action to be applied to the network message being searched in response to matching a predefined value in a given field.

32. (New) The information searching device of claim 31 wherein the network message is an Internet Protocol Version 6 (IPv6) message.

33. (New) The information searching device of claim 31 wherein the action is one of forward, drop, encrypt and log.

34. (New) The information searching device of claim 29 wherein each downstream associative memory compares its segment of information against the output from its respective upstream associative memory and the selected portion of data.

35. (New) A method of searching one or more fields of a network message for a predefined value, the method comprising the steps of:

loading a plurality of associative memories, which are organized in a stream, with information against which the fields of the network message are searched;

storing at least one or more fields of the network message in a buffer;

selectively applying at least part of a network message field from the buffer to an upstream associative memory to generate an output; and

selectively applying at least part of a network message field from the buffer and the output of the upstream associative memory to a downstream associative memory;

generating an action to be applied to the network message from the last associative memory.

36. (New) The method of claim 35 further comprising the steps of:

prior to loading the information into the plurality of associative memories, translating the information a Boolean function; and

storing a segment of the Boolean function in each associative memory.

37. (New) The method of claim 36 further comprising the step of providing a secondary memory for each of the associative memories, the secondary memories configured to store the outputs.

38. (New) The method of claim 37 wherein the information loaded into the associative memories corresponds to one or more Access Control Lists (ACLs).

39. (New) The method of claim 38 wherein each associative memory is a ternary content addressable memory (TCAM) supporting don't care values.